Tuesday, 24/02/2009 9:51:40 AM
Jean-Luc Menard

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services
Job Number : 46054
Estimate Number : 13166
P.O. Number :
This Issue : 24/02/2009 S.O. No. :
Prsht Rev. : NC
First Issue : / /
Type : MACHINED PARTS
Previous Run : 44685
Written By : 09.02.24
Checked & Approved By :
Comment : Rev:A New Issue 08-01-29 JLM Veriified By:EC
Est Rev:B Material Change 09-01-07 JLM Verified By:EC
Est Rev:C Added note on Step 2 09-01-26 JLM Verified By:EC

Drawing Name : STUD
Part Number : D36885
Drawing Number : D3688 REV B
Project Number : N/A
Drawing Revision : B
Material :
Due Date : 03/03/2009 Qty: 12 Um: Each

11 NDT

Additional Product

Job Number:

Seq. #:	Machine Or Operation:	Description :
1.0	M174PHH900R1000	17-4PH SS ROUND BAR 1.00 COND.900

Comment: Qty.: 1.1414 f(s)/Unit Total : 13.6962 f(s)
17-4PH SS ROUND BAR 1.00 ***CONDITION H900****
BATCH: M110990 09/03/06 (12)

2.0	BAND SAW	BAND SAW

Comment: BAND SAW
DO NOT USE CHOP SAW
Cut blank 12.020" long 09/03/06 (12)

3.0	DOOSAN LATHE	DOOSAN LATHE

Comment: DOOSAN LATHE
1-Turn as per Folio FA719 Rev: N/A & Dwg D3688 Rev: B

2-Deburr per dwg D3688 09/03/06 (12)

4.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE 09/03/06 (12)

5.0	LATHE CONV.	CONVENTIONAL LATHE

Comment: CONVENTIONAL LATHE
Face to finished lengh as per dwg D3688 AND center drill as per Dwg D3688 09/03/06 (12)

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3688-5 PAR #: _____ Fault Category: _____ NCR: Yes (No) DQA: D Date: 09/03/20

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: 46054		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B: Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
09/03/20	3.0	Vibration occurs during thread-cutting operation. RC: Process		Center drill 2 sizes bigger from #2 to #4. See attached sheet.	09/03/20	09/03/10		09-03-10

NOTE: Date & initial all entries

Date: Tuesday, 24/02/2009 9:51:40 AM
User: Jean-Luc Menard

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** STUD

Job Number: 46054 **Part Number:** D36885

Job Number:

Seq. #:	Machine Or Operation:	Description :
6.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE 09/08/06 (12)

7.0	DOOSAN LATHE	DOOSAN LATHE

Comment: Doosan Lathe

1- Turn as per Folio FA719 Rev: N/A & Dwg D3688 Rev: B

2-Deburr per dwg D3688 09/03/07 PTO

8.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE 09/03/07 (11)

9.0	QC8	SECOND CHECK

Comment: SECOND CHECK 09/03/10 (11)

10.0	PG	PURCHASING

Comment: PURCHASING

Issue P/O: 8382 8.3737363 09/03/11

LPI Per ASTM 1417 LEVEL 2

Certificate of conformaty is required (11)

11.0	PACKAGING 1	PACKAGING RESOURCE #1

Comment: PACKAGING RESOURCE #1

Receive & Inspect For Transit Damage

Ensure certificate of conformity is attached 09/3/11 (11)

12.0	QC5	INSPECT WORK TO CURRENT STEP

Comment: INSPECT WORK TO CURRENT STEP 05/03/12 (11)

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3688-5 PAR #: NA Fault Category: Prod/Machined Part NCR: (Yes) No DQA: D Date: 09/03/06

Resolution: SCRAP Disposition: SCRAP QA: N/C Closed: D Date: 09/03/06

NCR: 46054		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
09/03/06	1	RH thread instead of LH. Operator error. R.C: operator error.	OSCP	SCRAP & DO NOT REPLACE	RO 09/04/06	09/03/06	OSCP	09-03-10

NOTE: Date & initial all entries

Date: Tuesday, 24/02/2009 9:51:40 AM
User: Jean-Luc Menard

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** STUD

Job Number: 46054 **Part Number:** D36885

Job Number:

Seq. #:	Machine Or Operation:	Description :
13.0	PACKAGING 1	PACKAGING RESOURCE #1

Comment: PACKAGING RESOURCE #1
Identify and Stock
Location:_____

9/3/13

Seq. #:	Machine Or Operation:	Description :
14.0	QC21	FINAL INSPECTION/W/O RELEASE

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion

09.03.16

Form: rprocess

DART AEROSPACE LTD	Work Order:	46054
Description: STUD	Part Number:	D3688-5
Inspection Dwg: D3688 Rev: B		Page 1 of 1

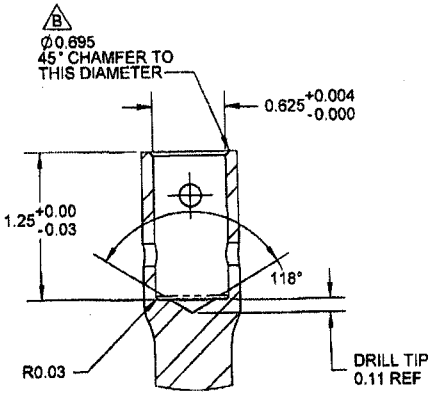
FIRST ARTICLE INSPECTION CHECKLIST

[X] First Article [ ] Prototype

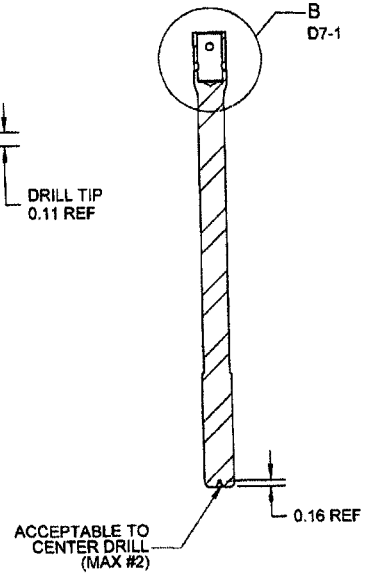
Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
1.25	+.000 −.030	1.227	✓			
Ø.695	±.010	Ø.693	✓			
.625	+.004 −.000	.626	✓			
Ø.825	±.010	Ø.826	✓			
.870	±.000 .010	.865	✓			
Ø.659	±.000 .015	Ø.647	✓			
Ø.189	+.004 −.001	Ø.191	✓			
1.31	±.030	1.310	✓			
1.65	±.030	1.650	✓			
11.920	±.015	11.920	✓			
2.90	±.030	2.915	✓			
.075X 45°	±.010	.065X45°	✓			
.370	±.000 .010	.365	✓			
Ø.189	±.004 .001	Ø.191	✓			
R.25	±.030	R.250	✓			
R.50	±.030	R.500	✓			
3/4-16UNF-2A	.7485 .7391	.7438	✓			
M.O.W.	.7737 .7643	.773	✓			

Measured by:		Audited by:		Prototype Approval:	N/A
Date:	09/03/06	Date:	09/03/10	Date:	N/A

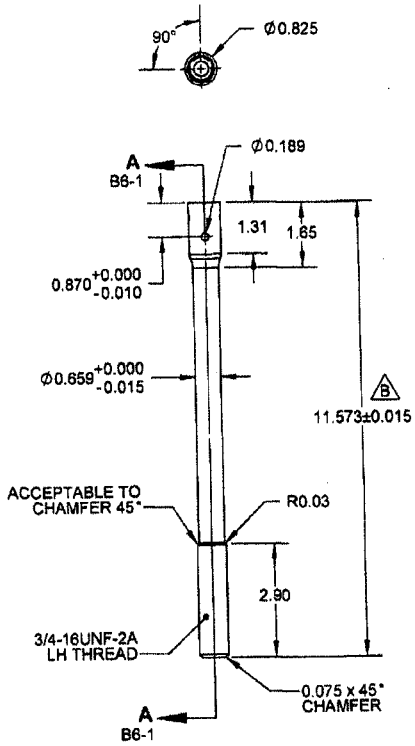
Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	

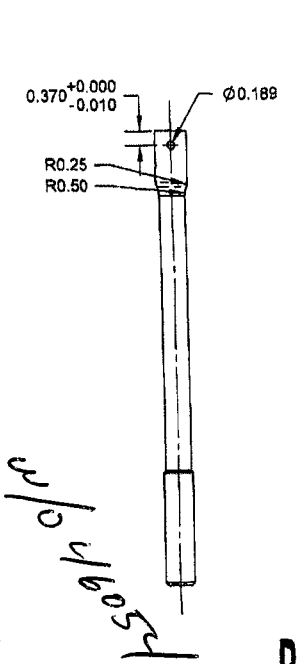


DETAIL B
SCALE 3X
D6-1



SECTION A-A
D4-1





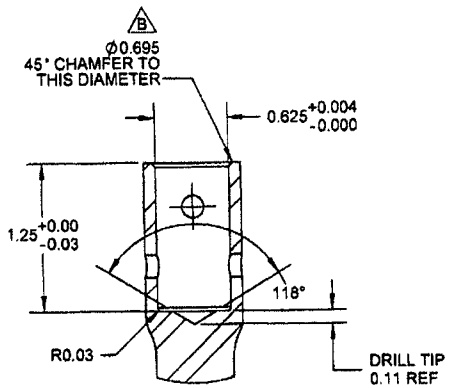
D3688-1 STUD

RELEASED
08/12/15 MD

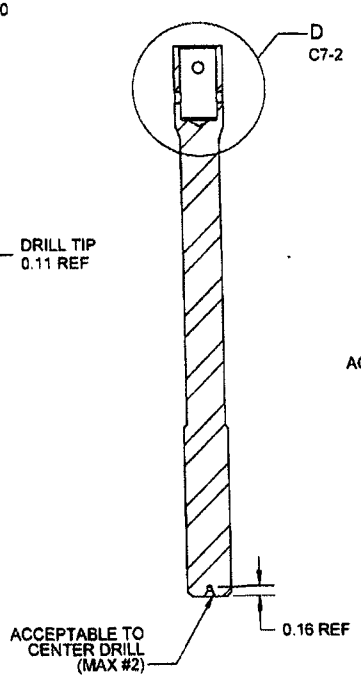
NOTES:
1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
2) FINISH: NONE
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: NONE
7) WEIGHT: 1.24 lb
8) LPI PER ASTM 1417 LEVEL 2

REV.	DESCRIPTION	BY	DATE
B	CHANGE TO 17-4PH H-900 (ZN A8-1, A8-2, A8-3, A4-4); REDUCE LENGTH ON D3688-1 FROM 12.073 TO 11.573 (ZN C3-1) BASED ON PROTOTYPE INSTALL: Ø0.695 WAS Ø0.665 (ZN D8-1, D8-2, D8-3); Ø0.508 WAS Ø0.478 (ZN D8-4); REFORMATTED TO CURRENT DWG STANDARDS	RF	08.11.24
A	NEW ISSUE	RF	08.05.22

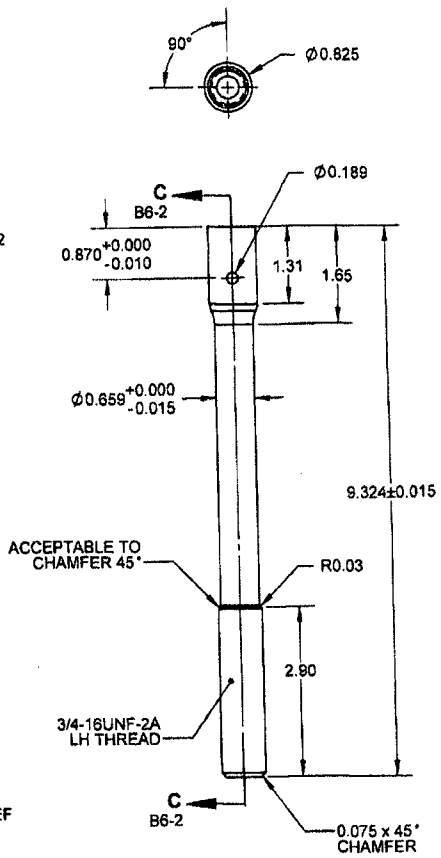
DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. B
MFG. APPR.		D3688	SHEET 1 OF 4
APPROVED		TITLE	SCALE
DE APPR.		STUD	NTS
DATE	08.11.24		



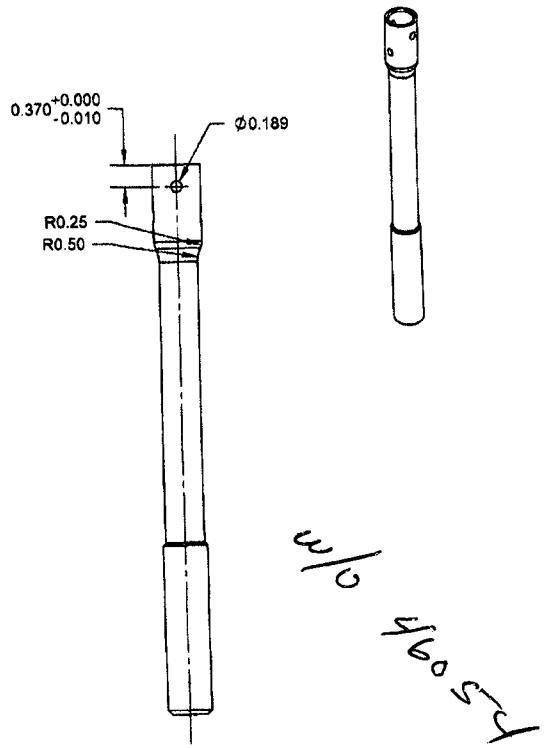
DETAIL D
SCALE 2X
D6-2



SECTION C-C
D4-2



D3688-3 STUD

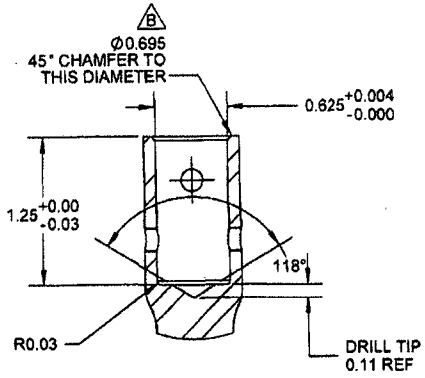


w/o 4605-4

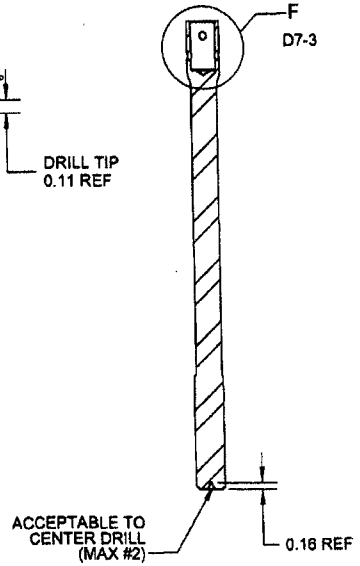
RELEASED
08/12/19 NP

NOTES:
B
1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
2) FINISH: NONE
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: NONE
7) WEIGHT: 0.97 lb
8) LPI PER ASTM 1417 LEVEL 2

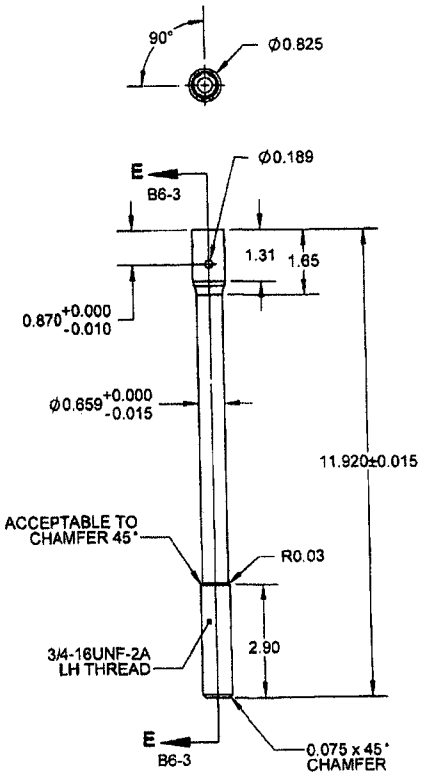
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	
CHECKED		DRAWING NO. D3688 REV. B
MFG. APPR.		SHEET 2 OF 4
APPROVED		TITLE STUD SCALE NTS
DE APPR.		
DATE	08.11.24	

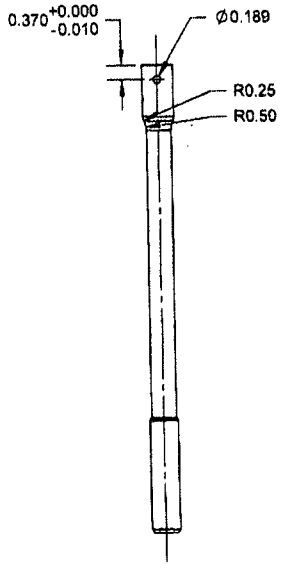


DETAIL F
SCALE 3X
D6-3



SECTION E-E
D4-3





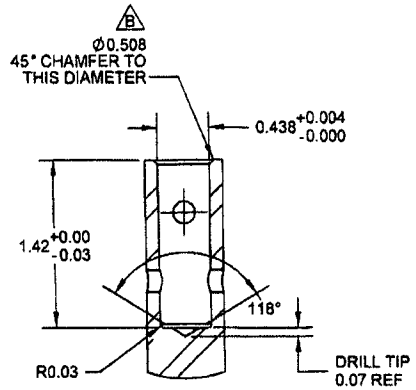
D3688-5 STUD

w/o 1/6054

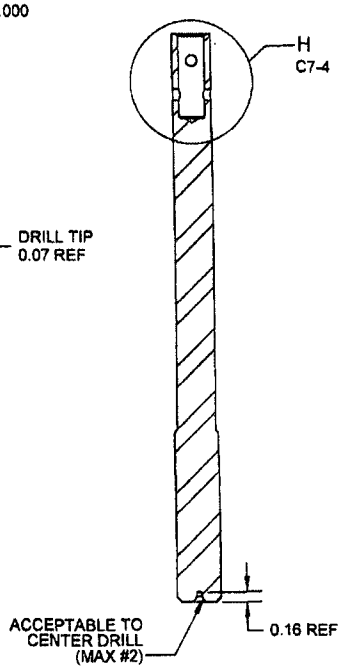
RELEASED
08/12/15 NJD

NOTES:
B
1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
2) FINISH: NONE
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: NONE
7) WEIGHT: 1.26 lb
8) LPI PER ASTM 1417 LEVEL 2

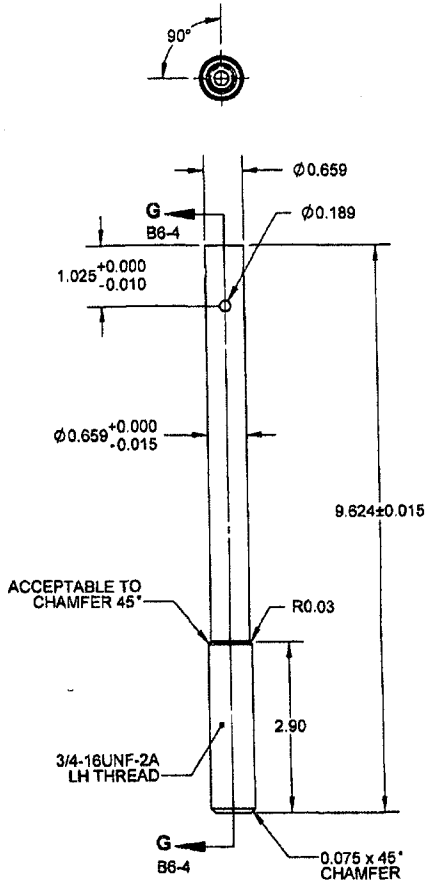
DESIGN	RF	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED		DRAWING NO. D3688 REV. B
MFG. APPR.		SHEET 3 OF 4
APPROVED		TITLE STUD SCALE NTS
DE APPR.		
DATE	08.11.24	



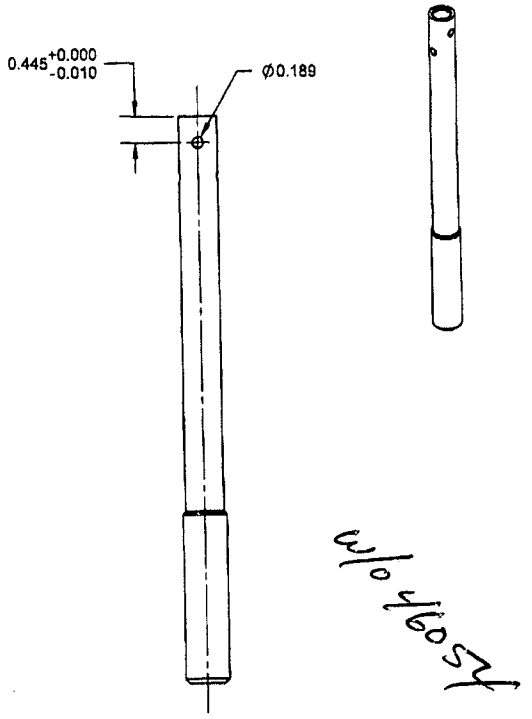
DETAIL H
SCALE 2X
D6-4



SECTION G-G
D4-4



D3688-7 STUD



w/o 46054

RELEASED
08/12/15 MT

NOTES:
1) MATERIAL: 17-4PH STAINLESS STEEL ROUND BAR PER AMS 5643 H-900 CONDITION
2) FINISH: NONE
3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
4) UNITS: INCHES UNLESS OTHERWISE NOTED
5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
6) IDENTIFICATION: NONE
7) WEIGHT: 0.97 lb
8) LPI PER ASTM 1417 LEVEL 2

DESIGN	RF	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED		DRAWING NO. D3688 REV. B
MFG. APPR.		SHEET 4 OF 4
APPROVED		TITLE STUD SCALE NTS
DE APPR.		
DATE	08.11.24	

Jean-Luc Menard

From: David Shepherd [dshepherd@dartaero.com]
Sent: March 9, 2009 12:48 PM
To: 'Jean-Luc Menard'
Cc: 'Mike Petsche'; 'Roberto Fuentes (Roberto Fuentes)'
Subject: RE: engine mount studs D3691 & D3688

JL,

As discussed, it is acceptable to change from a #2 center drill to a #4 center drill on current production of the D3691 & D3688 engine mount studs.
Please consider this email acceptance of this deviation.

Roberto,

Please work with Kim to put D3691 and D3688 Under Review.
Then, please update drawings D3691 and D3688 for future production over the next month or so.

Thanks,
David

-----Original Message-----
From: Jean-Luc Menard [mailto:jmenard@dartaero.com]
Sent: Monday, March 09, 2009 9:44 AM
To: David Shepherd (David Shepherd)
Cc: Mike Petsche; Roberto Fuentes (Roberto Fuentes)
Subject: engine mount studs D3691 & D3688

David,

As dicussed,we would change the center drill in the parts to #4 from #2.

This would result in better support in the lathe resulting in better surface finish.

This is fine for these parts,what did you want to do for future parts?

Let me know.

JLM

Jean-Luc Menard

Production Engineering Coordinator

1270 Aberdeen Street

Hawkesbury Ontario

Canada K6A 1K7

Tel:(613)632-5200 Ext 227

<mailto:jmenard@dartaero.com> jmenard@dartaero.com

ACUREN

P- 14935

LIQUID PENETRANT TEST REPORT

PAGE 1 OF 1

CLIENT: DART AEROSPACE | DATE: MAR 11-2009 | TIME: AM ☑ PM ☐

ATTENTION: LINDA / SHAWN TEL | ACUREN JOB NO.: 188-09-001343

ADDRESS: 1270 ABERDEEN ST, HAWKESBURY, ON K6A 1K7 | PO/WO NO.: — 8382

WORK LOCATION: HAWKESBURY - SITE | ACCEPTANCE STD.: ASTM 1417 | REV./DATE: 2007

PROJECT: F.P.I. ON 100% EX TENAL.

ITEM(S) EXAMINED: FIVE CROSS TUBES - 39 MACHINED PARTS - MOTOR MOUNTING

JOB DESCRIPTION | PROCEDURE NO. LT-XXXX REV./DATE | TECHNIQUE NO. LT-XXXX-XXX REV./DATE

PART NO. — | MATERIAL | THICKNESS —

SCOPE: WET FLUORESCENT LIQUID PENETRANT INSPECTION ON 39 STAINLESS STEEL PARTS, 5 ALUDINE ALUMINUM X-TUBES

TEST DETAILS

METHOD	☑ FLUORESCENT	☐ VISIBLE	☑ WATER WASH	☐ SOLVENT REMOVABLE	☐ POST EMULSIFIED
FAMILY BRAND	MAGNAFLUX		BLACK LIGHT S/N	1165 ☑ OUTPUT > 1000 µ W/CM²	☐ AMBIENT < 2 fc
PENETRANT	ZL67	MINIMUM DWELL TIME 45 ~~10~~ MIN.	LIGHTING EQUIP.	☐ FLASHLIGHT ☐ TROUBLELIGHT	☐ OUTPUT>100 fc @ SURFACE
PENETRANT REMOVER	H2O	MINIMUM DRY TIME >10 MIN.	OTHER	LABINO	
DEVELOPER	SKD 52	MINIMUM DWELL TIME 10 MIN.	LIGHT METER S/N		CAL DUE DATE FEB 2010
DEVELOPER TYPE	☑ NON AQUEOUS	☐ AQUEOUS ☐ DRY			

TEST SURFACE

SURFACE CONDITION	☐ AS GROUND	☐ AS WELDED	☐ MACHINED	☐ SHOT BLASTED	☐ CLEAN BARE METAL
SURFACE TEMPERATURE	☐ < - 4°C/ 20°F	☐ - 4°C/ 20°F TO 10°C/50°F		☐ 10°C/50°F TO 52°C/125°F	☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

		COMMENTS	ACCEPT	REJECT
9	JOB #	45671		
10	#	45670		
11	#	46051		
11	#	46059.		
1	JOB #	46094		
1	#	46092.		
1	#	46093.		
1	#	46371		
1	#	46372.		

ALL ITEMS WERE FOUND ACCEPTABLE

SIGNATURES

CLIENT REPRESENTATIVE: Ian Titley (PRINT) | (SIGNATURE)

TECHNICIAN (SIGNATURE): | 1ST TECHNICIAN | 2ND TECHNICIAN

NAME (PRINT): Mike Johnston

CGSB LEVEL II SNT LEVEL — CGSB REG. NO — | CGSB LEVEL — SNT LEVEL — CGSB REG. NO —

DTR # E-19816

REPORT REVIEWED BY:

NAME	INITIALS

WHITE – CLIENT COPY CANARY – OFFICE COPY PINK – TECHNICIAN COPY GOLD – OFFICE COPY